Progress Report
Pacific Islands Regional Integrated Ocean Observing System (Pacific IOOS)

Submitted by
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1.0 Progress on Regional Association Development

This report covers the period from December 1, 2005 through June 30, 2006. The notice of award for first-year funding for the Pacific Islands Integrated Ocean Observing System (PacIOOS)[1] was received on July 29, 2005 although the official start date on the grant is listed as June 1, 2005. This grant began the formal process of planning for the development of a Pacific Islands IOOS program and the Regional Association governance structure that will support it.

PacIOOS activities during the performance period covered by this Progress Report addressed the following objectives associated with the emergence of an effective Pacific IOOS regional program:

- **Ensure broad engagement of key stakeholders and partner institutions** in the development of an initial Pacific IOOS program with continuing efforts to assess progress, address problems and explore new opportunities;
- **Identify critical information needs** in the high-priority areas described above including completion of an inventory of existing observing systems and information products, the identification of critical gaps and the development of recommendations for new or enhanced ocean information products; and
- **Establish appropriate program oversight, coordination and implementation mechanisms** to support a Pacific IOOS regional program.

Key activities and highlights of accomplishments during the December 2005 through June 2006 period include:

- Continued to support the work of the Observations and Data Management hui of the interagency Pacific Risk Management ‘Ohana (PRiMO) to identify risk management information needs and priorities and move towards completion of an inventory of current ocean observing systems supporting risk management in the PacIOOS region;

[1] PacIOOS is being designed to address ocean observations requirements and priorities in the American Flag Pacific Islands (Hawaii, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands) and the U.S. Affiliated Pacific Islands including the Federated States of Micronesia, the Republic of the Marshall Islands and the Republic of Palau.

- Supplemented the PRiMO inventory effort in the context of weather and climate-related risks through discussions with key climate partner programs and institutions including NOAA/NWS, NOAA/NESDIS, UH/IPRC and UH/SOEST among others and the initiation of a regional observations inventory in the climate theme area;

- Initiated discussions with key partners in marine and coastal ecosystem research and management (e.g., UH/HIMB, UHSOEST, NOAA/NMFS, NOAA/NOS-Sanctuaries) in order to (1) undertake a regional inventory of ocean and coastal observations in this theme area; and (2) explore critical information needs and opportunities for collaboration in a PacIOOS context;

- Continued development of a recommendation for an initial PacIOOS governance structure that will be vetted with PacIOOS partners and stakeholders in the second year of the PacIOOS planning grant which began on June 1, 2006;

- Continued support for the Pacific Islands Global Ocean Observing System (PI-GOOS) through service on the PI-GOOS steering committee and dialogue and joint planning with the PI-GOOS Program Officer at the South Pacific Applied Geosciences Commission (SOPAC);

- Continued support for the Pacific Islands Global Climate Observing System (PI-GCOS) through service on the PI-GCOS steering committee and dialogue and joint planning with the PI-GCOS Program Officer at the Secretariat for the Pacific Regional Environment Programme (SPREP);

- Established a collaborative working relationship with the new NOAA Integrated Data and Environmental Applications – NOAA IDEA – Center through which IDEA Center staff will support education/outreach and data management activities during the development phase of PacIOOS.

- Significantly enhanced the PacIOOS website through the addition of new materials, links and documentation related to the development of PacIOOS and initial PacIOOS product lines such as wave and water level (http://research.eastwestcenter.org/PacIOOS);

- Continued discussions with University of Hawaii scientists, private sector firms and Federal agencies to further define and develop their interest in and potential contributions to a Pacific Regional IOOS/GCOOS program. In spring 2006, this effort accelerated in the context of exploring opportunities for collaboration between PacIOOS and emerging plans for a Hawaii ocean observing initiative being developed by the University of Hawaii School of Ocean and Earth Sciences and Technology (UH/SOEST);

- Continued work with the Pacific Risk Management ‘Ohana (PRiMO), NOAA’s Pacific Services Center, the Pacific Disaster Center, the NOAA IDEA Center advance the development of a wave and water level product line as an early PacIOOS priority in response to deliberations of the PRiMO observations and data management hui. This work built on a December 2005 Wave and Water Level Data Framework Workshop held at the East-West Center. The Workshop was organized to advance the objective of aligning wave and water level data collection, archiving, integration and sharing throughout the Pacific Region. A Workshop summary, presentations and background material can be found at the PacIOOS website (http://research.eastwestcenter.org/PacIOOS/wwl.html);

- Continued development of an initial integrated data product suite on wave and water level including activities in support of the development an XML Web Service to support tsunami detection and warning. Specifically, IDEA Center staff, Pacific Disaster Center (PDC) IT staff, and NOAA Pacific Tsunami Warning Center (PTWC) staff met with International Oceanographic Data and Information Exchange (IODE) and Global Sea Level Observing System (GLOSS) UNESCO/IOC staff at the IODE office in Oostende, Belgium to coordinate ongoing activities related to XML schema and accompanying client application development in this area. Meetings for FY 06 PRIDE “Wave and Water Level Web Service for Pacific Tsunami Warning Center” with PDC, PTWC, and NOAA IDEA Center staff to confirm schematics for mapping message products into WWL schema for the prototype web service are also relevant in this regard;

- Convened a Pacific Region Integrated Data Products (PRICP) Expert Teams Workshop in late June. This workshop brought together more than 25 recognized experts in the area of climate-related processes that govern storminess and its expression as heavy rains, strong winds, and high seas in the Pacific region. It served as a detailed scientific planning meeting for a coastal climatologies regional demonstration project. The wave and water levels product development efforts fall under the category of high seas in the context of this broader coastal climatology effort being undertaken by the NOAA IDEA Center in collaboration with PacIOOS and other partners;

- Contributed to ongoing surveys of regional programs and needs in support of the Integrated Ocean Observing System (IOOS) program including participation in a telephone interview by representatives of Raytheon in support of a NOAA IOOS planning contract as well as discussions with staff of the NOAA Coastal Services Center as part of their ongoing assessment of regional needs for CSC technical support;

- Augmented the September 2005 introductory PacIOOS Symposium in American Samoa by conducting similar sessions during April and May 2006 in other American Flag and U.S. Affiliated Pacific Islands including the Republic of the Marshall Islands, the Federated States of Micronesia, Guam, the Commonwealth of the Northern Mariana Islands and the Republic of Palau. These initial PacIOOS discussions were conducted in conjunction with Workshop on the Consequences of Climate Variability and Change organized by the East-West Center through a grant from the NOAA Climate Services Center. The September 2005 Symposium was the first in what will be a series of introductory PacIOOS planning meetings in the American Flag and U.S. Affiliated Pacific Islands and was designed to support the identification of initial PacIOOS priorities in these jurisdictions and facilitate the establishment of a local PacIOOS planning capability including designation of a PacIOOS liaison in each jurisdiction. Summaries of the Workshops and PacIOOS Symposium are currently being written and will be posted on both the PacIOOS and East-West Center climate websites;

- In conjunction with the Oceans 2006 conference in Honolulu, co-hosted a Pacific OOS workshop designed to provide opportunity for the IOOS regional associations bordering the Pacific Ocean to get to know each other better and learn what each region is doing for ocean observing:

  • Share accomplishments and lessons learned
  • Explore opportunities for collaboration
  • Increase integration with Pacific.

  Presentations and summaries of breakout group discussions issues relating to data management, modeling, and information products and services can be found at the PacIOOS website (http://research.eastwestcenter.org/PacIOOS/pacificoos.html)

- Continued conversations with potential partners in PacIOOS education and outreach activities including: the Pacific Services Center; education/Outreach Specialist staff of the Hawaiian Islands Humpback Whale National Marine Sanctuary and the Northwest Hawaiian Islands National Monument; the Pacific Resources for Education and Learning (PREL); education/outreach representatives of other west coast IOOS programs, COSEE programs and teachers; and continued discussions with Hawaii State Department of Health, Hawaii Sea Grant and the HI Department of Education regarding potential collaboration in environmental education;

- PacIOOS Education/Outreach staff participated in Geophysical Information for Teachers (GIFT) Workshop held in conjunction with the 2006 Ocean Sciences conference. The GIFT Workshop provided an opportunity for teachers in Hawaii to interact with ocean scientists from NOAA and universities to help bring cutting-edge science into the classroom;

- PacIOOS Education/Outreach staff contacted partners to develop a hazards inventory of education and outreach materials and efforts. This will be an ongoing effort to benefit PRiMO's Hui on Communications, Education and Outreach as well as support PacIOOS education and outreach work in the area of risk management;

- Discussions with Hawaiian Islands Humpback Whale National Marine Sanctuary to incorporate ocean observing into the Sanctuary's ocean curriculum being developed for the Department of Education.

- Continued discussions with scientific staff responsible for developing a Pacific NEON program of terrestrial ecosystem observations in the American Flag and U.S. Affiliated Pacific Islands regarding potential areas of collaboration.

2. Priorities for Observations from a Regional Perspective

No significant changes to the general priorities described in the November 2005 semi-annual Progress Report.

Participation in the deliberations of the PRiMO observations and data management hui and discussions with the All Islands Coastal Zone Management group confirmed the importance of the development of enhanced information on wave and water level risks which are being addressed as an initial PacIOOS and PRiMO priority. PacIOOS is moving forward on this front and updates on progress will continue to be made available on the PacIOOS website.

Deliberations during the introductory PacIOOS workshops throughout Micronesia reinforced the initial data and information priorities identified during the September 2005 symposium in American Samoa and reported on in the last semi-annual report (November 2005). As noted earlier, summaries of the information needs and priorities identified during these symposia will be posted on the PacIOOS website by fall of 2006.

As noted in previous semi-annual reports (March 2005 and November 2005), the Pacific IOOS team believes that *one of the highest priorities for FY07 and beyond is the explicit identification of sufficient funding for the Regional Program component of IOOS* as well as National Backbone funding priorities in Agency budget requests to Congress. This includes, as a high priority, securing the legislative and executive branch authorities to move from the current funding situation to a truly national program with sufficient funding for full national coverage in both planning AND implementation of regional IOOS programs.

3.0 Issues, Challenges and Opportunities

- PacIOOS will continue to explore exciting opportunities to link Pacific IOOS ocean ecosystem observing and data management activities with similar observational and data management interests of the *NEON program* that focuses on long-term observations of terrestrial ecosystems. The Hawaiian resource management concept of ahupua'a – from the mountain ridge to the outer edge of the coral reef – acknowledges the importance of addressing resource management and ecosystem health issues in an integrated fashion in the coastal zone. One specific area of shared interest is in meeting the data integration and visualization challenges that both programs face and, with support from the NOAA IDEA Center, we are considering the possibility of joint planning workshop on that subject in early 2006.

- The Pacific IOOS team continues to be involved in the development of a Pacific Islands Climate Information System (PaCIS) in the context of identifying and addressing climate-related aspects of Pacific IOOS. A PaCIS program framework describing the integration of climate observations, forecasting, research, research, modeling, assessment, data management and education is currently being developed. In addition to providing regional climate services to American Flag and U.S. Affiliated Pacific Islands, PaCIS is being developed in the context of a U.S. contribution to the emergence of a Regional Climate Centre for Oceania under the auspices of the World Meteorological Organization (RA-V).

- Consistent with last year's RA consensus on the need to fully fund regional planning activities at funding levels greater than are currently available, the Pacific IOOS team would like to draw attention to the increasing demands for time, people and money to contribute to a variety of implementation activities at the national level such as the IOOS demonstration project, DMAC, national-level education planning, etc. These activities are placing increasing demands on already over-constrained Regional budgets and personnel.

- With respect to certification of the RAs, even though the certification hinging on DMAC compliance has been delayed, it is problematic because guidelines are incomplete, because certification applies to the RA's not the sub regional observing elements, and because there are questions in regards to the degree of compliance that will be required in each of the DMAC areas (discovery, catalog, metadata, access, transport, and archive).